Flag on the Play: Using Technology to Tackle Self Reporting of Concussions in Collegiate Football
Samantha Havel (BME), Benjamin Schmitt (CS), Frank Kennedy (ECE), Anne Cater (CHE)
Advisors: Professor Stoddard and Professor Rao

Problem

43% of college football players fail to report their concussions in order to remain in a game, resulting in mental and physical impairments that can lead to death.

Solution: Sensors and Tests Take Self Reporting Out of Play

1. OPTICAL IMPACT MONITOR
The optical impact monitor uses an accelerometer to measure impact velocity. The OIM also monitors eye movement to mimic how the brain moves during impact.

2. NANO COMPOSITE FOAM
Nano composite foam uses triboelectric response to measure impact and the amount of energy transferred to the head upon impact.

Implementation and Assessment: The Playbook

App: The Concussion Playbook

1. Receives Data from Player Sensors and alerts when a potential concussion is detected
2. Provides quick, sideline concussion testing and analysis.

Baseline Testing
Visual, and Short-Term Memory Tests (Memorizing words, sentences) Tests will provide scores, used for analysis in the event of brain trauma.

Sideline Testing
Similar to baseline, quick short-term and visual memory tests
Will immediately recommend taking a player out or not

Post-Test Analysis
Compares baseline and post sideline test scores
Recommends a doctor visit if deemed necessary

Impact on Players

Decrease in Cognitive and Motor Activity
Long Term Mental Illness and Suicide
Multiplier Risk of another Concussion

Acknowledgements
Mara Brown – Assistant Athletic Trainer at Clark University
Songbai Ji – Professor in Biomedical Engineering at Worcester Polytechnic Institute
Scott Sperone – Football Defensive Coordinator at Worcester Polytechnic Institute

Key References